Castlemaine Naturalist

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Monthly newsletter of the Castlemaine Field Naturalists Club Inc.

The critically endangered Corroboree Frog
photo by Noel Young

July Meeting Report: Speaker, Dr Matt West "Protecting frogs from the Chytrid fungus"

At our July monthly meeting, we were privileged to have a talk by amphibian ecologist, Dr Matt West (BSc, M Reprod Sci, PhD), who provided us with an update on the status of research into the chytrid fungus and its impact on frog populations as well as strategies for protecting frogs from this deadly fungus. Matt is a wildlife consultant for "Wild Research" with projects aimed at protecting threatened species with partnerships including the Threatened Species Recovery Hub, Zoos Victoria, DEECA, CMAs and traditional owners. He is also a Research Fellow at the University of Melbourne School of Biosciences.

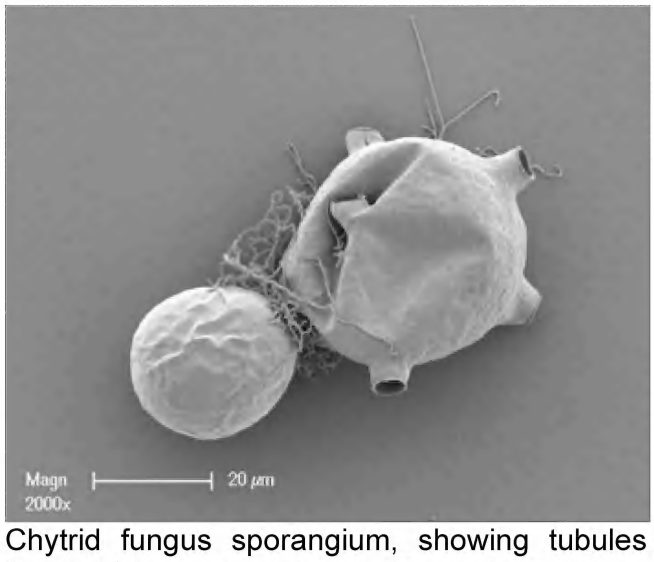
Matt first gave us some background history. It was when scientists gathered at the First World Congress of Herpetology in 1989, that it became obvious that there was a serious decline in frog populations worldwide. Habitat change was soon identified as a major cause of amphibian decline, but it was the finding of a large number of dead frogs in the rivers of the Sierra Nevada that pointed to disease as a cause and the chytrid fungus was identified as the pathogen. Matt showed us images of the fungus and explained its life cycle. Water-borne fungal spores attach and burrow into the frog's skin, where they mature and develop into a sporangium which after a few days releases another batch of spores into the water. Infection with this fungus causes the frogs to shed layers of skin, disrupting normal skin function of gas exchange and osmoregulation. The effect on ion transport leads to cardiac arrest and death. An obvious sign of this disease, called Chytridiomycosis, is the frog's lack of ability to right itself after being turned over.

Detection of the chytrid fungus can now be made from a swab of the frog using a genetic lab test. A map showing sites of chytrid detection revealed

Dr Matt West collecting samples at one of his study locations. *Photo by Michael Williams*

the enormous scale of the problem globally. Chytrid has been shown to infect over 700 amphibian species, many in decline and some likely heading for extinction. In Australia, chytrid was first detected in Brisbane in 1978 and has now spread along the east and south-east regions including Tasmania as well as in southern WA.

An important finding was that not all frog species are susceptible to Chytridiomycosis despite being infected. So many researchers including Matt, are studying the factors that influence chytrid disease outcome. Environmentally, temperature and salinity have been found to be important, with temperatures over 28C causing death of the fungus. High salinity, acidic or basic conditions also reduce chytrid disease. The frogs themselves have natural defences from resident skin bacteria, microbial peptides and complement proteins that can cause inflammation and lyse the pathogen. Some frog species have robust immune defences. Matt is currently studying the range of genetic variations in the chytrid fungus. These have been shown to affect the number of spores released ie the virulence of the fungus. So Matt explained that there is a disease triangle between pathogen virulence, host susceptibility and environmental factors.



Chytrid fungus sporangium, showing tubules from which new spores are released.

Photo: Matt West

Matt then explained how we can use this knowledge to design strategies for protecting frogs from chytrid disease. The fungus is obviously now too widespread for tackling eradication or containment (sound familiar?) but control and mitigation are possible. Individual frogs can be treated with anti-fungals, heat and salt but this is not possible at a population level. The fungus can survive in wet conditions for up to 3 months and there are multiple host frog species, so a cleaned frog returned to the wild is likely to be rapidly reinfected. Matt described projects for three species of frogs that are in decline. The first was to create and identify environmental refuges for the Growling Grass Frog, *Litoria raniformis*, which is listed as endangered in Victoria. Following extensive mapping of temperature and salinity of wetlands through central and northern Victoria, sites where chytrid would thrive were predicted. This was confirmed by the decreased incidence of the Growling Grass Frog detected at those wetlands. As a result, it was decided that the Winton Wetlands in northern Victoria with warmer temperature and higher salinity would provide a suitable refuge for this frog. So populations are being collected from the Bendigo water treatment plant for quarantine and captive breeding before translocation to the Winton Wetlands, the "Task Frog Growler" project.

Growling Grass Frog. *Photo: Jenny Rolland*

Another even more urgent project is aimed at protecting the critically endangered Corroboree Frog (*Pseudophryne corroboree)* by preventing transmission from host reservoir species. For this, fenced-off breeding areas are being built in the Kosciusko National Park where the frogs can build up numbers free from contact with fungal-infected but less susceptible species such as the Common Eastern Froglet (*Crinia signifera*). A similar strategy is being trialled for the Alpine Tree Frog (*Litoria verreauxii alpina*) which has the additional threat of habitat destruction from deer which trample and destroy water bodies.

Thirdly, Matt presented a project designed to improve frog survival by identifying factors that increase reproductive output. For this, the critically endangered Spotted Tree Frog (*Litoria spenceri*) was compared with the common, non-threatened Lesueur's Frog (*Litoria lesueuri*). Interestingly, elevation was shown to be an important influence. On balance, the effects of elevation on number of eggs/clutch, age at maturation and longevity,

meant that Lesueur's Frog was able to better survive at higher elevations. This study also revealed another important threat to frogs, predatory non-native fish! This has lead to a productive partnership with recreational fishing groups, reducing these fish species in selected areas, especially Brown Trout and Rainbow Trout. So, safe havens for our native frogs can be further defined by selection of areas free from non-native fish species, in addition to sites where factors improve reproductive success and where the chytrid fungus doesn't survive.

Finally in discussion, Matt addressed the question of "What can we do?" He urged us all to use the FrogID app to record frog calls wherever we are to better map the distribution of species and monitor their numbers. Cleaning our boots and spraying the soles with a fungicide (as we are already doing on our field trips for plant pathogens) is another way in which we can reduce the spread of the chytrid fungus. And of course we need to continue to nurture and protect our wonderful wetlands and the insects on which our frogs feed.

Jenny Rolland

Excursion: Remeasuring Smiths Reef Quadrats.

Between 2001 and 2014 club stalwart, Ern Perkins established over a hundred permanently marked vegetation quadrats in forests across the region. His intention was to monitor and report on the impacts of fire on significant plant species and record the recovery and changes to the vegetation over time. In most cases there are pairs of plots, one inside and one outside proposed burn areas.

It was a cool overcast afternoon with rain threatening when about 25 members and friends, including a strong contingent from Maldon met at Smiths Reef dam, Maldon Historic Area, to examine and remeasure one of the Perkins vegetation quadrats. Among those present were Leslie Perkins, Richard Piesse and Denis Hurley, veterans from the original surveys who were able to provide valuable insights into how the quadrats were surveyed.

The location was chosen because there is a planned burn scheduled for this area and we already have three sets of prior data from before and after the last planned burn in 2009. The first challenge was relocating the corner marker. This is a short length of steel pipe that had been hammered into the ground near the base of a prominent tree to mark the north-west corner of the quadrat. Running lines were then laid out to delineate the boundary (20x20m) and then subdivide the quadrat into five strips 4m wide to make recording of the plants easier.

After laying out the quadrat some of the group carried out the count while the rest of the group explored the nearby area recording what was found in the wider area of the burn site.

During the quadrat survey we managed to find 33 species which included most of the species that had been found in the original surveys. Those species not recorded were herbaceous plants that were unlikely to be visible at this time of the year. We also found three species, *Xerochrysum viscosum*, *Luzula meridionalis* and *Pterostylis smaragdyna*, that were not on the original lists for the quadrat. Outside the quadrat more than thirty species of vascular plant, of which seven or eight were not found inside the quadrat, were recorded as well as mosses and numerous fungi and lichen. Those species recorded outside the quadrat included the rare *Eucalyptus aurifodina*, Small-leafed Brown Stringybark.

This excursion was a good introduction to the survey method and what is involved for the majority of those present who had little or no experience of formal botanical surveys. This will provide valuable information as to how our forests recover following fire and inform the ongoing debate about fuel reduction activities. We will write up the results of this survey for a future Castlemaine Naturalist and enter the data into the Victorian Biodiversity Atlas.

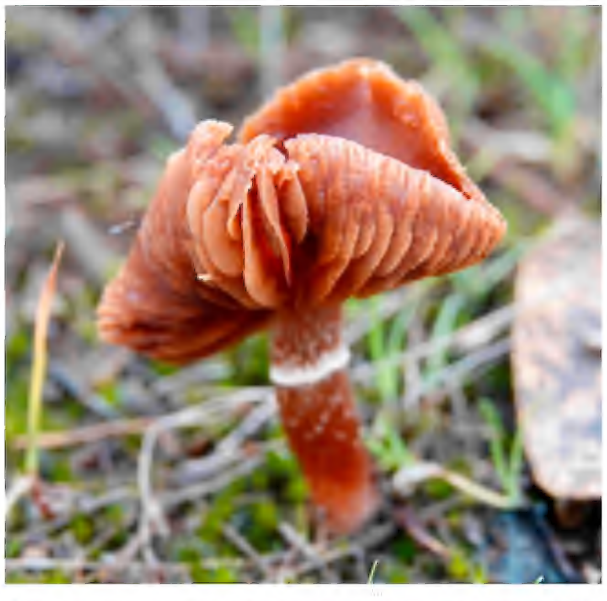
The club would like to have a group of keen plant enthusiasts who can repeat more of these surveys. Please contact the committee (castlemainefnc@hotmail.com.au) if you would like to help.

Euan Moore

Left: Some of the group recording plant information during the survey.
Right: Leslie Perkins setting up the running lines.

Observations

Cathrine Harboe-Ree McCay Res. Excursion - Fungi gallery



Opposite page, clockwise from top left: Graceful Parasol *Macrolepiota clelandii*, Elegant Blue Webcap *Cortinarius rotundisporous*, Trooping Crumble Cap *Coprinellus disseminatus*, *Mycena subgalericulata, Leucopaxillus eucalyptorum*, *Descolia* sp. (all at McCay except the Blue Webcap near Smiths Reef).
Below left: Whirligig beetles at McCay Res.

Lou Citroen
Restless Flycatcher, July 4 (uncommon here)
Painted Button-Quail – one of two on May 18 near the Goldfields railway track.

Russell Stanley I went exploring the Fryerstown and Fryers Ridge areas on July 11 and found a selection of colourful fungi as well as a small number of Veined Helmet Orchid *Corybas diemenicus*. Unfortunately the millipedes had done all the flowers a fair bit of damage. Here are a couple of the less chewed specimens.

Kerrie Jennings

Koala – seen a couple of weeks ago, Dunn's Track, Muckleford forest. Apparently seen occasionally in this area according to Geoff Park and Geoff Neville.

Right: White-bellied Cuckoo-shrike – dark phase, near Gough's Range.

Noel Young

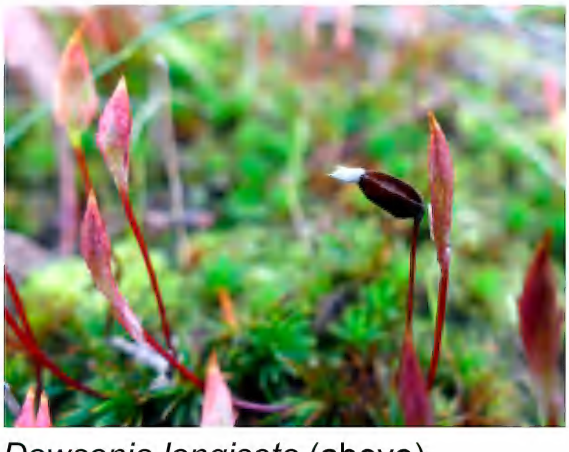
Rainbow Lorikeets – well they haven't taken over yet, but I often see a few around the Murphy Street trees in Wesley Hill, and sometimes in town. Here they are chewing seeds in a garden tree. I counted seven on this occasion. (July 30)

Mez Woodward

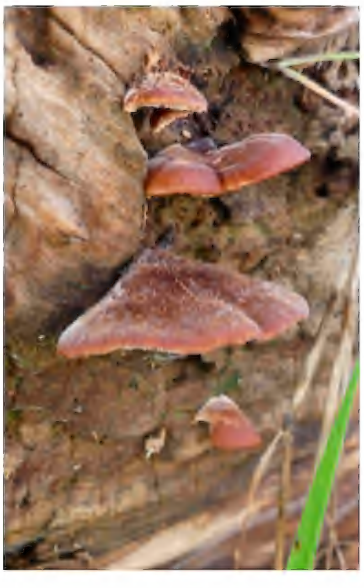
Lepidoscia casemoth. They are so tiny, max 5mm to date, and typically feed on the lichen that is the same color as them, so devilishly hard to find.

Cortinarius persplendidus

Stereum illudens



Dawsonia longiseta (above)
Right: Tamopsis spider egg sac
Far right: *Lentinellis pulvinulis*



Birds of Sutton Grange July 2023

Nigel Harland

Superb Fairy-wren	White-browed Scrubwren	Australian Magpie
Australian Raven	Laughing Kookaburra	Yellow-tufted Honeyeater
Sulphur-crested Cockatoo	Long-billed Corella	Crimson Rosella
Red Wattlebird	Galah	Grey Currawong
Grey Shrikethrush	Black-faced Cuckoo-shrike	Eurasian Blackbird
Red-browed Finch (big mob)	Brown Falcon	

Book recommendation

This event is coming up at Books at the Brewery on Tuesday September 12, and I thought it may be of interest to members and therefore considered for inclusion in the newsletter or mention at the next meeting:

Books at the Brewery – Harry Saddler, "A Clear Flowing Yarra"

A passionate, evocative love letter to an iconic waterway, and an opportunity to appreciate the natural beauty right on our doorsteps.

Description:

They say you can't step in the same river twice, and it's true that the Yarra has been hugely changed - but this book is a glorious and timely reminder that things can also be changed for the better.

Nature writer Harry Saddler hops, skips and jumps his way along, beside, on and even in the Yarra River from source to mouth, revelling in its hidden beauty, getting close to platypuses, kingfishers, Krefft's gliders and the occasional seal, and meeting many of the swimmers, bushwalkers, ecologists and traditional owners who are quietly and tenaciously restoring the river, patch by patch.

Optimistic, inspiring and heartfelt, A Clear Flowing Yarra is a passionate love letter to the river that shapes Melbourne, and an evocative vision of what it is now and what it can be.

Harry will be in conversation with local conservationist and passionate reader, John Lewis.

For Booking details contact:

johnalewis72@gmail.com

John Lewis

COMING EVENTS

Monthly Meeting: Friday 11th August, 7.30pm by Zoom.

Speakers: Tracy Lyten and Fiona Jackson (Skylos Ecology),
"The Role of Detection Dogs in Conservation"

See Back Page for details on how to join the Zoom meeting.

Skylos Ecology Co-Founders Tracy Lyten and Fiona Jackson will discuss the specialised use of detection dogs in the conservation world. They will explore how dogs are providing a valuable service in helping protect Australia's flora and fauna.

From endangered species detection, fox and feral cat management to the detection of invasive weeds, Tracy and Fiona will share their experiences in handling conservation detection dogs for environmental data collection.

Members and visitors are invited to share their interesting observations at the meeting. This month, please email any photos to illustrate your report as JPEG file(s) to Cathrine Harboe-Ree (cathrine.harboe-ree@monash.edu) by noon on the day of the meeting.

Excursion: Saturday 12th August, 12 noon.

"Whipstick Wildflowers"

Leaders: Peter Turner & Noel Young.

Join us for a walk in the Whipstick, Greater Bendigo National Park, to enjoy the emerging spring wildflowers in this beautiful box ironbark forest.

Meet: 12 noon at the Octopus car park (Duke St, opposite the Castle Motel) or at Shadbolts Picnic ground, Whipstick, Bendigo ready to start the walk at 1.30pm after a picnic lunch. There are toilet facilities at the picnic ground.

Bring: Picnic lunch, water, afternoon tea, sturdy shoes and if necessary, wet weather gear.

Boot hygiene: Please clean your boots thoroughly before leaving home. On arrival at the excursion site, we will spray the soles of our boots with Phytoclean.

The Field Trip will be cancelled in extreme weather conditions.

Disclaimer: The opinions expressed in this newsletter are those of the contributors and not necessarily those of the club

Castlemaine Field Naturalists Club

PROGRAM

Monthly meetings are being held on-line via Zoom during the winter months (June - August) commencing at 7.30pm. If you registered for the June or July meetings, you will be sent the link for registering with Zoom for the August meeting. Otherwise, please email Peter Turner at munrodsl@iinet.net.au to register and then receive the link for joining the Zoom meeting.
Members and visitors are invited to share their interesting observations at the meeting. Please email any photos to illustrate your report as JPEG file(s) to cathrine.harboe-ree@monash.edu by noon on the day of the meeting.

Excursions (Saturday following the monthly meeting) leave from the car park opposite the Castle Motel, Duke Street at 1.30pm unless stated otherwise.

See 'Coming Events' page 11 for more details about August events.

Fri August 11, Meeting 7.30pm (by Zoom). Speakers: Tracy Lyten & Fiona Jackson (Skylos Ecology) "The role of detection dogs in conservation".

Sat August 12, Excursion 12 noon at the Octopus or 1.30pm at Shadbolts Picnic ground, Whipstick, Bendigo. Leaders: Peter Turner & Noel Young, "Whipstick wildflower walk".

Fri September 8, Meeting 7.30pm (Uniting Church Hall). Combined with Birdlife Castlemaine. Speaker: Jane Rusden "Birding in SA Desert country".

Sat/Sun September 9/10, Excursions near Ballarat – private wildlife sanctuary (Sat) and Clarkesdale wildflowers with Ballarat FNC (Sun); Clarkesdale camping option.

Visitors are welcome at club activities

Club website (Web master: Ron Wescott) - www.castlemainefieldnaturalists.org.au

Castlemaine Naturalist - email newsletter material to: newsletter.cfnc@gmail.com

*Deadline for the September edition is 25th of August.

Subscriptions for 2023 (now due, forms and payment details on the club website)
Ordinary membership: Single $35, Family $50
Pensioner or student: Single $25, Family $30
Subscription includes the monthly newsletter, Castlemaine Naturalist

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